DEPARTMENT OF CONSUMER AND INDUSTRY SERVICES

DIRECTOR=S OFFICE

OCCUPATIONAL HEALTH STANDARDS

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PART 520. VENTILATION CONTROL

Rule 3101 Ventilation Control

(1) Scope and applicability

This rule applies to all processes and places of employment. Additional requirements for the following operations and industries are set in Part II, III, and IV of this Chapter:

(a) Ventilation control of specific processes - Part II of this Chapter.

(b) Control measures for hazard atmospheres - Part III of this Chapter.

(c) Control measures for special industries - Part IV of this Chapter.

(2) Definitions. As used in this rule:

(a) **"Aerosol"** means particulate matter suspended in air. [R 325.2402(a)]

(b) **"Contaminant"** means an airborne material capable of causing occupational disease or significant physiological disturbances to a person, and includes but is not limited to the substances listed in Rule 2102 to 2104. [R 325.2402(b)]

(c) **"Control"** means the limitation of worker exposure to contaminant levels not exceeding the maximum concentrations set in Rules 2102 to 2104. [R 325.2410(a)]

(d) **"Controlled process"** means an arrangement of equipment to control the contaminant by means of suitable design measures. [R 325.2410(b)]

(e) **"Enclosure"** means a room, booth or exhaust hood that confines contaminants at their sources. [R 325.2410(c)]

(f) **"Gas"** means a normally formless fluid which occupies a space or enclosure and which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both. [R 325.2402(e)]

(g) **"General ventilation"** means the supply and removal of air from a space to dilute or remove contaminants. [R 325.2410(d)]

(h) **"Local exhaust ventilation system"** means an arrangement of exhaust hoods, ducts and fans that removes air to control a contaminant at its source. [R 325.2410(e)]

(i) **"Process space"** means a tunnel, process equipment, shaft or enclosed space. [R 325.2410(f)]

(j) **"Source"** means a process or equipment which releases a contaminant into the air in concentrations exceeding the limits set in Chapter II of these rules. [R 325.2403(f)]

(k) **"Supply ventilation system"** means an arrangement of inlet openings or equipment to introduce outside air into the working environment. [R 325.2410(g)]

(l) **"Vapor"** means the gaseous state of a substance. [R 325.2402(j)]

(3) Control methods for enclosures and controlled processes.

(a) An enclosure shall be provided at a stationary source unless the omission of the enclosure does not impair control. [R 325.2429(1)]

(b) Controlled process shall be designed and regulated to prevent the creation of a hazard to health or life. If the Director determines that there may be an immediate danger to health or life due to the failure of the process design or regulatory device he may require that the process fail-safe in such manner to avert the hazard. [R 325.2429(2)]

(4) Supply ventilation systems.

(a) A supply ventilation system shall be provided to insure a flow of air into the working environment to replace the volume of air exhausted. [R 325.2434(1)]

(b) A mechanical air supply system shall be provided if its absence will result in building negative pressures sufficient to cause backdrafting of vents from fuel-fired equipment or ineffective control. [R 325.2434(2)]

(c) Mechanical air supply volumes shall be heated to maintain a minimum air temperature of 65°F. measured at the point of air discharge to the space. Exceptions to this requirement are refrigerated storage rooms, special process rooms and similar locations where low air temperatures are essential to the preservation of the product or service, or if in the opinion of the Director a lower air temperature will not be harmful to the health of the persons affected. [R 325.2434(3)]

(d) Make-up air for spray-finishing operations. See Rule 3235(9).

(e) Make-up air for open surface tanks. See Rule 3220(8)(c).

(5) Direct-fired air heaters.

(a) A direct-fired air heater, wherein combustion products are released in the supply air stream, may be installed in buildings of industrial occupancy, garages, laundries and commercial kitchens. They shall not be installed in offices, schools, hospitals and places of public assembly. [R 325.2435(1)]

(b) A direct-fired air heater shall have an inlet duct connected directly to the out-of-doors. Room air shall not be circulated across the burner. [R 325.2435(2)]

(c) A direct-fired air heater shall deliver air which contains no more than 10 ppm of carbon monoxide and is free from odors of combustion products. Permissible concentrations of other contaminants in the delivered air may be established by the director pursuant to their MAC and the degree of exposure to a person. [R 325.2435(3)]

(d) The air volume supplied to the building by a direct-fired air heater shall not exceed 110% of the total air volume exhausted. The director may require interlocking of a heater control system with an exhaust ventilation system if necessary to insure that the exhaust systems are operating. [R 325.2435(4)]

(e) A direct-fired air heater shall have:

(i) A pre-ignition purge of fresh air; and

(ii) A positive fuel supply closure in the event of fuel supply failure, ignition failure, flame failure, power failure or interruption, or air flow reduction below 50% of it rated capacity. [R 325.2435(5)]

(6) Exhaust ventilation systems. The minimum rate of exhaust ventilation for places of manufacturing, processing, assembling, maintenance and repair, or storage of material shall be one cubic foot of air per minute per square foot of floor area. This amount of exhaust ventilation may be provided by local exhaust, general exhaust, or both. The Director may permit a variance if contaminant control shall be accomplished at a lesser rate of ventilation. [R 325.2436]

(7) Local exhaust ventilation.

(a) Local exhaust ventilation shall be provided at all stationary sources. The Director may allow a variance from this requirement if control will be accomplished with general ventilation. [R 325.2437(1)]

(b) If a local exhaust system is used, the exhaust air volume shall create an indraft air volume at an enclosure, hood, duct or fan sufficient to control the contaminant. [R 325.2437(2)]

(c) A local exhaust system shall be designed to capture and control the contaminant. Distribution of exhaust air between various exhaust points should be accomplished by balanced duct design. If balancing gates are used, they shall be locked permanently in place after final adjustment. [R 325.2437(3)]

(d) The design and construction of a local exhaust ventilation system shall be adequate for the contaminant and conditions of service. A listing of practical ventilation texts and references shall be available from the Director upon request. Technical information and experience regarding specific contaminants and control measures may be obtained from the Director. [R 325.2437(4)]

(8) General ventilation systems. A general ventilation system may be used for contaminant control. The ventilation air volume shall be sufficient to dilute the airborne contaminant to levels not exceeding the levels listed in Chapter II of these rules. [R 325.2438]

(9) Exhaust system discharge locations. The discharge locations of local exhaust or general exhaust systems shall not permit exhausted air to re-enter a workroom or other buildings directly, or indirectly, through air supply systems without substantial dilution. [R 325.2439]

(10) Recirculation of air from exhaust systems.

(a) The recirculation of air containing a contaminant whose MAC is equal to or exceeds 1000 ppm, 15 mg/m^3, or 50 mppcf, shall be permitted if the exhaust ventilation system is equipped with an air-cleaning device capable of reducing the contaminant concentrations to 10% or less of their MAC in the returned air. [R 325.2440(1)]

(b) The Director may allow the recirculation of air containing a contaminant whose MAC is less than 1000 ppm, 15 mg/m^3, or 50 mppcf, if the toxicity of the contaminant and the degree of air cleaning to be achieved create an environment which will not impair the health of the workers, and if the contaminant concentrations in the return air shall not exceed 10% of its MAC. [R 325.2440(2)]

(c) A recirculation system shall include an alternate air duct connection to discharge the return air outside of the building if necessary to protect the workers' health. [R 325.2440(3)]

(d) Spray-finishing operations using flammable and combustible materials. See Rule 3235(6)(j).

(11) Air pollution control. A local exhaust and general exhaust ventilation system shall comply with rules adopted by the air pollution control commission being R 336.11 to R 336.62 of the Michigan Administrative Code. [R 325.2441]